CONJUNCTION OF JUPITER AND β SCORPII.—Mr. J. Birmingham, Millbrook, Tuam, writes as follows with reference to the near approach of Jupiter to the bright star β Scorpii on the morning of Feb. 28.—"The weather prevented any observation until 19h. 25m. Greenwich M.T., when the western limb of Jupiter had nearly, but scarcely quite, reached the R.A. of the star. The micrometer-wire through the star then just grazed the northern edge of the planet, and so closely that it could not be said for certain that there had not been actual contact. Clouds coming on again soon put an end to the observation." Allusion was lately made to the above phenomenon in this column.

NOTE ON BIELA'S COMET.—It will be remembered that when, on the appearance of Biela's Comet in 1805, the similarity of elements to those of the comet of 1772 had been remarked, it was pointed out by Gauss that the differences between the orbits, particularly the diminution of the inclination, could not be accounted for except on the supposition that in the interval the comet had undergone perturbations from one of the larger planets, and the necessary proximity could only have been consistent with the assumption that several revolutions had been performed in the interval between 1772 and 1805, as on the next observation of the comet in the spring of 1826 was proved to have been the case.

If we adopt the elements for 1772 assigned by the late Prof. Hubbard of Washington in his masterly investigation on the motion of this comet, we shall find the following distances from the orbit of the planet Jupiter:—

True Anomaly.	Radius vector.	Distance.
+ 156° 0′	5·029	0·316
157 30	5·143	0·281
158 0	5·180	0·283
+ 160 0	5·327	0·344

A true anomaly of 157° 30′ corresponds to 645·5 days after a perihelion passage, and the comet would arrive at this point of its orbit, which may be taken as that of nearest proximity to the orbit of Jupiter about 1794·21, while the planet would be in the same longitude about 1794·43, and it thus appears that it was in the spring of the year 1794 that the very material changes in the elements of the comet's orbit were caused by the attraction of Jupiter. Another near approach of the two bodies would appear to have taken place towards the end of the year 1746.

THE NEW GERMAN SCIENTIFIC EXPEDITION TO THE OBI

THE Expedition to Northern Siberia, fitted out by the "Verein für die Deutsche Nordpolarfahrt in Bremen"—the same Society which sent out the Second German North Polar Expedition, and published the excellent account of its results—left Bremen last week. The attention of the Council of the Society having been called to the immense unexplored area between the Jenisei and the Obi, it was resolved, as there were not sufficient funds for a naval expedition this year, to send out a small zoological and ethnographical expedition overland to the Obi, which appeared to be less known than the Jenisei. In this they received the warm support of the highest scientific authorities at St. Petersburg who were asked for advice on the subject. Dr. Otto Finsch, Director of the Zoological Museum at Bremen, was appointed leader of the expedition, and Dr. Brehm, the well-known author of "Das Thierleben" and many other natural history works was selected to accompany him. They were joined by Count Walburg-Zeil-Trauchburg of Stuttgardt, who made an expedition to Spitzbergen in 1870 at his own expense, and who is well acquainted with physics and is a good botanist. Professor Oscar Schmidt of Strasburg, who had likewise intended to go, was unavoidably prevented at the last moment. The route selected is by St. Petersburg and Moscow to Nishni, and thence in sledges viâ Kasan, Perm, Ekaterinenburg and Omsk to Semipalatinsk. Thence a detour will be made, if possible, into the Altai. From Ekaterinenburg they will go to Barnaul and down the Obi to the embouchure of this river. They will return to Germany in the autumn—certainly not without a rich harvest of results.

UNIVERSITY REFORM

(Communicated.)

THE speech of Lord Salisbury on introducing a bill to reform the University of Oxford, inaugurates a fresh epoch in the history of University reform. The speech nominally referred to Oxford only, but the principles enunciated in it apply equally to both Universities. The defects of the Oxford system, pointed out with such clearness by Lord Salisbury, are also the defects of the Cambridge system, and the remedies to be applied, must, in their broader features, be the same for the two Universities.

Lord Salisbury lays it down as the cardinal point in his scheme of reform that, till the requirements of the University for teaching and research are satisfied, no portion of the funds of the colleges ought to be employed for endowing idle fellowships.

"I do not know," he says, "that what is available from the whole of the idle fellowships will be required for University purposes, and I do not venture to lay down the principle that no fellowship should exist which would give the holder no educational work, and which should last for a few years. It may be wise to maintain a few of these, limiting the holding of them to a certain number of years, but I do venture to lay down that all the University wants in the shape of museums, libraries, lecture-rooms, and the proper payment of teachers, should be provided for before the subject of furnishing incomes to men who do nothing can be entertained."

The enunciation of such views as these by a Conservative Minister must be hailed by genuine University reformers as a most reassuring sign of the progress of public opinion. Up to the present time such principles as those contained in Lord Salisbury's speech have only been whispered in secret by a few men who have been generally regarded as extreme and unpractical; but it is to be hoped that for the future these principles will form the starting-point of University reform. It is to be regretted that they have not been more distinctly embodied in the Bill presented to Parliament. The indefiniteness of the plan of reform there laid down, and the powers of resistance secured to individual colleges, seriously detract from its efficiency. We trust that these points will be altered in Committee; otherwise everything will depend on the wisdom, union, and determination of the Commissioners.

Lord Salisbury alluded to the more pressing wants of the University of Oxford, which include a new library, museum, schools, and other permanent structures; and states that for these alone an immediate outlay of 210,000*l.* is required. In addition to this sum a large yearly income is needed to bring up the staff of University teachers to a suitable standard both in numbers and efficiency. Large as are the wants of Oxford, we believe that those of Cambridge are also very large both as regards permanent buildings and the professoriate. This is not only shown by the report of the Buildings Syndicate of the University of Cambridge, but also by the recent appointment of a Studies Syndicate, which indicates that the present staff of teachers is generally considered inadequate. The above facts are in themselves sufficient to demonstrate that, if the principles laid down by Lord Salisbury are firmly carried out by the Commissioners it will be necessary for them to abolish in a nearly complete manner the existing idle fellowships.

In fact the term "Fellow" will cease to be the name for a successful candidate in an examination, who, as a reward for his success, receives for a longer or shorter period a considerable income, and will become the title of one engaged in University work.

It must not, however, be lost sight of that the abolition of idle fellowships is only valuable as a means to an end —that end being the increased efficiency of the teaching and research in the Universities. On this account it becomes important to follow out the further changes which will be entailed by the abolition of idle fellowships.

On the abolition of these fellowships, all the colleges will be in possession of a large income entirely available for University purposes. A considerable part of this will no doubt be at once employed for the buildings and other permanent structures needed by the Universities, and will be handed over to the Universities either in the form of a yearly tax or a share of the college property. Of these two methods of contribution the former appears on the whole to be attended with the fewest inconveniences, and will have the further advantage of supplying at once an available income to the University.

On the most extravagant estimate it seems clear that, after all the requirements of the University for permanent buildings, &c., have been satisfied, the available revenues of the colleges will by no means be exhausted, but a considerable sum will still be left to meet the urgent need of fresh Fellows to carry on the work of the University.

Ought the money intended for the payment of these Fellows to be handed over to the University, or left in the hands of the colleges? Although some advantages might accrue from handing over the money directly to the University, yet the proposal cannot be entertained. No Conservative Government could thus despoil the colleges. The opposition would be too great and not improbably the whole scheme of reform might be ruined. If it is admitted that the money is to remain in the hands of the colleges, a further question arises as to the system under which the new Fellows are to be elected.

Is their election to be carried on by the colleges on the old system, or to be more or less directly under the control of the University? We believe that the value of the proposed reforms depends greatly upon the answer given to these questions.

In dealing with them in a practical way it is neither possible nor desirable to overlook the fact that a collegiate system of teaching exists. Were it proposed, while still leaving the money in the hands of the colleges, to remove the election of the Fellows completely from their control, they would feel greatly aggrieved and would offer the strongest opposition to the scheme. It certainly could not be looked on as otherwise than a hardship for the colleges, that they should have no voice in the election of the men who were to form their governing body.

It must not, however, be overlooked that so long as Fellows are elected on the present system, a great increase of efficiency in the teaching staff of the University cannot be anticipated.

The causes which render the present system unsatisfactory are for the most part easily detected. In the first place Fellows are not elected for their efficiency in teaching or in research, but on account of their success in an examination, a very unsatisfactory test either of their powers of research or their powers of teaching.

In the second place, the standard requisite to obtain a fellowship, especially at Cambridge, is very different in the various colleges. In some of the smaller colleges the standard is very low, yet were the present system to be continued, these colleges would go on appointing Fellows totally incompetent for their University position.

In the third place, the nature of the colleges as closed corporations causes it frequently to happen that, after a man has been elected to a fellowship and continues to reside, he is appointed to a lectureship in spite of evident incompetency. In addition to these inherent faults in the existing mode of election to fellowship, the present system labours under great defects owing to the absence of centralisation. So great are these defects, that both Universities have recognised, and to a certain extent attempted to cope with them. Cambridge has done so by starting what is known as the "intercollegiate system of lecture;" a system which consists in the combination of the greater number of the colleges for the purpose of having common lectures open to the students of all the combining colleges. Oxford possesses a somewhat similar system, including several combinations of three or more colleges with the same objects as the one combination at Cambridge.

We cannot enter into the details of these systems, but confine ourselves to pointing out that they are generally recognised as very imperfect substitutes for a completely centralised system. They contain no sufficient guarantee for the efficiency of the teachers employed, and in the case of subjects where the students are few, the very existence of these systems interferes with the appointment of fresh lecturers, however incompetent the existing lecturers may be; and lastly they afford no help whatever to research.

The past action of the Universities themselves, as well as other considerations, indicate that the present system of election to fellowships ought to be abandoned, and a system involving greater centralisation substituted for it.

Though Lord Salisbury does not distinctly state that he regards this centralisation as necessary, yet the general tenor of his speech clearly indicates that he does so; and the very argument he has used against permitting the colleges separately to reform themselves, applies equally against their separate action in the election of Fellows.

To meet the requirements of the University in the election of Fellows, it is necessary to devise some system in which a central board, directing and influencing the elections, shall work in concert with the colleges in whom the actual election must be vested.

The function of the central board ought not only to be the indication of the men to fill the fellowships, but also the settlement of the branches of study in which teaching or research is required. In the election of Fellows by a college, no preference ought to be shown to a member of the college, and the lectures of the Fellows ought to be equally open to all the students of the University. In such subjects as natural science, rooms ought to be assigned to the Fellows in the University buildings.

Whatever system of election of Fellows may ultimately be found advisable, the colleges will necessarily be left completely free to elect their Tutors, Bursars, Deans, and other officers, and the election of a certain number of Fellows for college teaching ought to be left in their hands.

The partial inefficiency of the present staff of University professors will probably be urged as an argument against the centralisation of teaching in the University. This inefficiency, so far as it exists, has mainly arisen from its not being possible for men who have obtained a University post to rise in their profession; and we believe that by instituting a series of grades, the highest of which shall only be held by distinguished men, it will be possible to supply the stimulus as necessary for efficiency in a University career as in all other professions.

The efficiency of the Professoriate in the German Universities appears to be mainly due to the existence of this stimulus, and we may therefore hope that the presence of this alone is necessary in order to render the professors in the English Universities as efficient as those in the German ones. Promotion ought of course to be granted for research as fully at least as for successful teaching, and a much-needed stimulus thereby given to learning in the Universities.

The remarks of Lord Salisbury on the question of research are quite as liberal as those on the questions of general education of the University. "The only point," he says, "in the connection to which I wish to call attention is that referring to research. We are of opinion that the mere duty of communicating knowledge to others does not fulfil all the functions of a University, and that the best Universities in former times have been those in which the instructors, in addition to imparting learning, were engaged in adding new stores to the already acquired accumulation of knowledge."

How best can research be combined with teaching? It will probably be found advisable to relieve from all teaching some of the professors who belong to the highest grade, and who have shown their capability for research; but we do not believe that this principle can with any advantage be generally adopted in the case of young and untried men. It would appear to be far safer to give opportunities of research by not demanding too much teaching work. With a large staff of lecturers it would not be necessary to demand from each more than two terms' teaching in the year. With only two terms' work and the remainder of the year free, ample time would be given for a teacher, not only to keep up with the progress of his subject, but also himself to advance it; but this point might be left for further consideration and experience.

The research we are anxious for is not confined to the natural sciences, but embraces all branches of learning, and we cannot better explain our view in this matter than by again quoting a passage from Lord Salisbury's speech. "What I am particularly anxious for," he says, "is that all branches of culture should have equal encouragement, and should be regarded not as rivals but as allies in the great and difficult task of cultivating and developing the human mind."

SCIENCE AND ART IN IRELAND

THE Royal Dublin Society held a special meeting on Thursday, March 2, to consider the Report of the Council on Lord Sandon's letter. In the absence of his Grace the Duke of Leinster, the President of the Society, the chair was taken by Sir George Hodson, Bart., one of the Vice-Presidents. Dr. Steele read the Report of Council, which concluded with a recommendation that the Society should sanction the Council's sending a deputation to London to press the following points upon her Majesty's Government:—

1. An assurance that the library, and the collections in the museums, shall be maintained in Dublin for the use of the public.
2. That ample accommodation shall be secured for the members of the Society for the purposes of their meetings, for their reading rooms, and for their officers; the whole being maintained for the Society, and under its own control.
3. That a suitable apartment as a reading room in connection with the library shall be provided for the exclusive use of the members of the Society.
4. That the members shall have the privilege, under reasonable restrictions and conditions, of borrowing books out of the library.
5. That the Agricultural Department shall be compensated by an equivalent for any space of which it may be deprived.
6. That the laboratory, with the services of an analyst, shall be preserved as heretofore for the purposes of the Society.
7. That the services of the present officers of the Society shall be retained; or the salaries and emoluments which they now enjoy secured to them.
8. That, as heretofore, an adequate staff shall be maintained for the purposes of the Society, or an equivalent grant to enable it to provide itself with the same.
9. That the members shall have free access to the new Institution at all times that such is open (whether by payment or otherwise) to the public.

That as some equivalent for the property surrendered, and as a compensation for a possible falling off in the income of the Society, an annual sum be granted to enable it to continue its several works of utility.

Mr. Ferguson moved a resolution in the following terms: "By reason of the very recent date of Lord Sandon's letter (Feb. 9, 1876) relative to the establishing in Dublin of a 'Science and Art Museum,' and the consequent short period the Council of the Society have had to make the Report thereon as this day laid before the Society, it is desirable that the consideration of the Council's Report be now adjourned till this day four weeks, for the purpose of enabling the Council to lay before the members of the Society such necessary information as will enable due and proper action to be taken on the several matters therein." This resolution was at once seconded by Dr. O'Donovan, and the necessity of adjourning was urged by several members to whom the leading facts in reference to the Society's relation to the Government, as stated in the Council's Report, appeared quite new. Dr. E. P. Wright said that the mover and seconder of the resolution asked for more light; to him it appeared as if the light they already had had dazzled them. Let the terms of the minute of the Science and Art Department of Sept. 21, 1865, be remembered, and how could the Society indulge in the illusion that the so-called Departments of the Society belonged to it otherwise than as in trust for the public? As to representing that the Government were not fully aware of the position of affairs, was it not a fact that the Chancellor of the Exchequer, Lord Sandon, and Mr. W. H. Smith had within the last few months personally inspected all the arrangements of the Society for themselves? and did anyone present doubt that Sir M. H. Beach had not a perfect knowledge of the Society's wants and merits? and then there had been a Parliamentary inquiry in 1864 and a Royal Commission in 1868. Why then waste time in asking for more information? Lord Sandon's letter was clear and explicit. Why not boldly face the inevitable, and see in the proposed scheme a means of having in Dublin what all desired, a National Library and a Museum of Science and Art? Several of the points asked by the Council it seemed probable would be yielded by the Government; but he appealed to those who had the true interests of their country at heart to support and co-operate with the Government in this matter, and not to treat them as Greeks, though bringing gifts. As the feeling of the meeting seemed to be in favour of having the Council's Report *in extenso* before them, he would move as an amendment: "That Lord Sandon's letter and the Report of the Council just read be printed and circulated among the members; and that this meeting do adjourn until this day fortnight—then to consider the same." This amendment was seconded by Lord Powerscourt, but on being put was negatived, whereon the original resolution was put from the chair and declared duly carried. It was further resolved that the Council should send a deputation to London to obtain such additional information as they could as to the intentions of the Government.

At a special meeting of the Royal Irish Academy, held on Monday last, the following amendments were adopted by a large majority:—

1. That the Royal Irish Academy being desirous of co-operating with her Majesty's Government in the measures necessary for the establishment of a National Science and Art Museum in Dublin, provided that the independence and usefulness of the Academy be not injuriously affected by such measures, is willing to consent to the